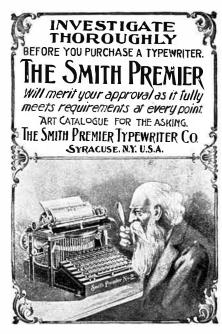
ELECTRICAL Thousands are successful and gaining better postENGINEERING tions and salaries studyENGINEERING tions and salaries studyIng at home by our mail
TAUGHT system. We teach Electrical Engineering, Mechanical Drawing, ElecBY MAIL tric Lighting, Short Popular
Electrical Course, Elementary Mathematics, by mail. Study in spar time only. Institute endorsed by Thomas A. Edison and others. Catalogue free.

ELECTRICAL ENGINEER INSTITUTE,
Dept. A, 240 W. 23d Street, New York.



▼HE whole history of the world is written and pictured week by week in Collier's Weekly. So well written and so well pictured that it is now the leading illustrated record o current events and has the large est circulation of any periodica in the world that sells for three dollars or more per year.

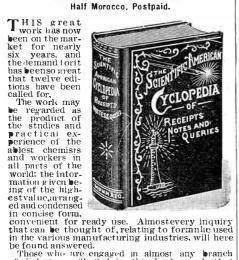
On sale at all newsstands. Price 10 cents per copy. Sample copy free. Address COLLIER'S WEEKLY, 525 West 13tb Street, New York City.



Cyclopedia of Receipts, Notes & Queries

12,500 RECEIPTS. 708 PAGES.

Price. \$5.00 in Cloth: \$6.00 in Sheep; \$6.50 in Half Morocco, Postpaid.



Those who are engaged in almost any branch of industry will find in this book much that is of practical value in their respective callings. Those who are in search of independent business or employment, relating to the home manufacture of salable articles, will find in it hundreds of most excellent suggestions.

MUNN & CO., Publishers, SCIENTIFIC AMERICAN OFFICE, 361 Broadway, NEW YORK.

1		
-1	Telegraphy, H. D. Bartholomew. Telephone signaling appliance for party telephone lines, Steiner & Tuck. Telephone switchboard supervisory signal, F. R. McBerty.	656,832
- 1	Telephone signaling appliance for party tele-	
-1	phone lines, Steiner & Tuck	656,907
- 1	Telephone switchboard supervisory signal, F. R.	
- 1	Telephone switchboard supervisory signal, F. R. McBerty. Telephone system, F. G. Rugh. Telephone trunk line signal, F. R. McBerty. Thill coupling, C. A. Beblen. Thill coupling, Chine & Handy. Toil coupling, R. Eccles. Threading machine J. H. MacLauchlan. Threading machine feeder attachment, T. H. Rolfe.	656.996
	Telephone system & G Rugh	656,703
	Telephone trunk line signal & R McRerty	656 007
- 1	Thill coupling C A Doblor	151 000
	Tom coupling, C. A. Beolei	000,040
v	Thill coupling, Cline & Handy	656,811
П	Toill coupling, R. Eccles	606. 905
7	Tbreading machine, J. H. MacLauchlan	656,848
	Threading machine feeder attachment, T. H.	
43	Rolfe	657.009
- 1	Ticket, win Kohnle & Kuhns	656 721
- 1	Threading machine feeder attachment, T. H. Rolfe. Ticket. pin, Kohnle & Kuhns Tie. See Cross tie.	()00,141
	Tin, electrolytically treating scrap, B. D. Ken-	
-1	Tin, electrolytically treating scrap, B. D. Ken-	454 000
	wall.	000.982
	Tire, elastic wheel, Tobler & Samuel.	698.060
- 1		
ш		657.060
- 11	Tires. valve for pneumatic bicycle, F. Richter	657,007
	Tubacco moistener 1) Griffen	656 816
	Tobacco nine H R Barton	657.010
	Tubucco pipe, II. D. Barton	(011010
	Tobacco pipes, etc., inter carringe for, 12. Lane-	11° 0 -110
	Tried	1500,6450
	Tongue support, vehicle, O. & C. Staton	taxi, lius
	Tool, combination. W. J. Barnes	656.622
	Tool handle joint, C. W. Allen	656.710
	Top. P. L. Koscialowski	656,771
	Tobacco pipe, H. B. Barton Tobacco pipes, etc., filter cartridge for, E. Landfried, Tobacco pipes, etc., filter, f	654: 090
	(Usin 1 A Chapman	050,323
	Toy, J. A. Chapman.	000,621
	Toy, mechanical. R. H. Sarvis	600,000
	Trace lock, adjustable, F. W. Crafts	657,022
	Trap. See Insect trap.	
	Trimmer Sue Venger trimmer	
	filmallow M (f) Cabatton	use run
	Troney, M. 1. Scoaffer	050,730
	Truck, car, J. A. Brill	618,060
	Truck, car, J. L. Levy	696,900
	Truck, radial car, J. P. Faye	656,885
	Truck, weighing, J. G. Emery, Jr.	656.717
	Truck weighing H Sawyer	656 790
	Trunk gover A M Wolcho	050 707
	Works Cos Mailing And a	000,101
	Tube. See Mailing tube.	45.4.400
	Tube hanging device. F. W. Barthels	656.623
	Type bar machine. R. H. St. John	657,043
	Type bar or matrix machines, spacing or justify-	
	ing device for R. H. St. John	657.039
	Truewriter I H Pholus	656 658
	Turowriting machine W H For et al	C56 ~05
	Typewriting machine, w. K. rox et al	000.100
	Vaccine tymph, grycerinized, r. M. Parker	600,160
	Vaccine point carrier, R. Walsh	656,914
	Valve, A. P. Broomeil	657.059
	Valve, D. Gilchrist	656,963
	Valve automatic hose R D Wirt.	656, 759
	Valve combined air water and check D k	
	Morgan. Valve, engine, W. S. Haines. Valve for fluid operated tools, throtile, C. II.	656 746
	Volve corrier W & II. inco	656,746 656,888
	valve, engine, vv. s. Haines	000,000
	valve for huld operated tools, throtile, C. II.	
	Johnson	656.981
	Valve, hydraulic motor, J. W. Johnson.	656,740
	Valve, locomotive tender, E. P. Cotter	656.629
	Valve non freezing Schmitt & McCinnis	656 731
	Valve tank 1 F Minor	656 010
	Valve, bank, J. B. Millol	000.040
	Valve for finite operated tools, throttle, C. 11. Johnson Valve, hydraulic motor, J. W. Johnson. Valve, blocomotive tender. F. P. Cotter. Valve, non, freezing, Schmitt & McGinnis. Valve, tank, J. E. Minor Vehicle brake, F. T. Harrington. Vehicle brake, C. Wigg. Vehicle frame mechanical joint, J. S. Copeland.	050.041
	Vehicle brake. C. Wigg	000.131
	venicle frame mechanical joint, J. S. Cobe-	4. 4
	tand	656.765
	Vehicle, motor, C. D. P. Gibsen.	656,962
	Vehicle seat, C. B. Moore	656,775
	Veneer trimmer, A. Nelson	figli, fight
Ш	Vise bench E H Sheldon	656 792
	Voting booth J H Rafter	657 090
	Voting machine E M Doring	658 719
	Vehicle frame mechanical joint, J. S. Cobeliand. Vehicle, motor, C. D. P. Gibson Vehicle seat, C. B. Moore. Veneer trimmer. A. Nelson. Visc. bench. E. H. Sheldon. Voting booth. J. H. Rafter. Voting machine, F. M. Boring. Wagon attachment for carrying axes, G. W. Lentz.	OF 11 11 11 11 11
	Wagon attachment for carrying axes, G. W. Lentz. Wagon running gear, A. Boeker. Wagon, tipping, C. W. Lyon. Washing machine, W. J. George. Water bag, India rubber, J. Parette. Water heater, instantaneous, M. 1. Coben. Water with gas, apparatus for impregnating, E. C. Worns. Watering tank, poultry, J. Ray.	#10 000
	Lentz	1106, S201
2	Wagon running gear, A. Boeker.	656,803
	Wagon, tipping, C. W. Lvon	656,773
	Washing machine, W. J. George	657 063
	Water har India nubben Danette	C.51. (75.0
- 1	Water bast in the day of the transfer of the t	0.00.0.74
	water heater, instantaneous, M. I. Coben	000.816
	water with gas, apparatus for impregnating, E.	40.00
٠.	C. Worns	656.919
S	Watering tank, poultry, J. Rav	656,727
	Wave motor, G. W. Hoff.	656,645
	Wave nower T C Clarke	656 9.12
1	Wonther strip 1 H Foces	656 694
1	(N) -1 Cas Wind -: N - bas)	0001004
	wheel. See windmin wheel.	050000
	windmill, C. F. Alger	000.922
,	Windmill wheel, J. E. Albers	656,921
7	Window chair, P. C. Camobell	656,626
	Water with gas, apparatus for impregnating, E. C. Worns. Watering tank, poultry, J. Ray Wave motor, G. W. Hoff. Wave power, T. C. Clarke. Weather strip, J. H. Foote. Wheel. See Windmill wheel. Windmill, C. F. Alger. Window chair, P. C. Campbell. Window frame and sash, metallic, C. D. Pruden. 656,650,	
_	656,659,	656 GED
f	Window sonon C A Vantaon	GCC 004
I	Window screen, G. A. Voulden. Wire grip, H. A. Mossman. Wool derreasing apparatus, M. A. Jacques. Work gaze, E. F. Mower. Wrapping machine, F. M. Peters.	166,000
	wire grip, H. A. Mossman	000,995
	Wool degreasing apparatus. M. A. Jacques	6:36,6:35
	Work gage. E. F. Mower	656,725
-	Wrapping machine, F. M. Peters	656.826
	Wrench, H. G. Hoadley	656.643
•		
1		

1	DESIGNS.			
	Air brake coupling member. M. S. Levering 33.129			
1	Atomizer casing, I. Q. Gurnee			
1	Battery cell, D. H. Darling, Jr. 33,131			
1	Bell, F. A. Scranton. 33,142 Belt, skirt supporting. M. L. Shepard. 33,119			
1	Belt, skirt supporting, M. L. Shepard			
П	Bicycle frame, C. W. H. Smithers			
١	Bicycle frame, F. A. Wilniot			
1	Brushes etc. backfor H A Weinman :23 191			
	Brushes, etc., back for. H. A. Weinman			
	Clothes line section, H. M. Vinson			
	Cow tail holder member, E. S. Geer 33.136			
ľ	Curb and gutter block. S. B. Morss			
ı	Frame, ornamental, D. Piersol			
ŀ	Hatchet head, J. F. Duffy			
ı	Ininaler, H. L. True			
L	Last. cobbler's, R. S. Sonley			
ŀ	Liquid container or vessel, J. H. Louch 33,130			
ı	Mantel. T. R. Price. 33 Pk			
П	Pin, safety, W. H. Bittner			
F	Plate lifter body member, C. Council			
ı	Puzzle board, A. Kinnicutt			
ı	Road roller wheel. G. F. Conner			
L	Sboe, J. H. Sparks			
	Stove, heating, H. P. Cope			
	Stove lid lifter, W. J. Kennedy			
	Stove water front. J. S. Van Buren			
	Vault light, R. M. Cox			
Į,	Wrapper, H. E. Shedd 53,117			
)	Wrapper, multiple, H. E. Shedd			
	LABELS.			

	LABELS.	
	"Anti Gon," for a medicine, Winn & Hubbard	7.763
	"Apollotonic," for a hair tonic, Century Chemical	7.760
	Company "C. W. C. Ginger Ale," for ginger ale, J. D. Gor-	
	man	7,753
	Medical Company "Duroy Brand," for fruit sirups and juices. Duroy	7,764
	& Haines Company "Gold Seal," for cigarettes, Knubel Tobacco Com-	7,756
	"Gold Seal," for cigarettes, Knubel Tobacco Com-	7,758
	pany "House's Baby Mixture," for a medicine, R. T.	7.765
	Smoot	
	"Jewelers' Luster." for a preparation for polish-	7,752
	ingmetals, glass, etc., A. S. Marsilliot	7.759
	"Madam Sherman's Vegetable Compound," for a medicine. Worlds Electro-Medical Institute	7,762
	"Red Top Rye," for whisky, F. Westheimer & Sons	7.755
	"Viver Mills," for rve whisky, J. A. Rosenbeim	7.754
ľ	"Stay There," for buckles. I. W. Levi	7,750
١	pany "The Hallwood." for cigars. Hallwood Cash Regis-	7.751
ľ	ter Company	7.757
ı	"Vaxo," for a medical compound, D. A. Strock	7,761
п		

PRINTS.

A printed copy of the specification and drawing of any patent in the foregoing list or any patent in print issued since 1863. will be furnished from this office for 10 cents. In ordering please state the name and number of the patent desired, and remit to Munn & Co., 361 Broadway, New York. Special rates will be given where a large number of copies are desired at one time.

Canadian patents may now be obtained by the inventors for any of the inventions named in the fore going list, provided they are simple, at a cost of \$40 each. If complicated the cost will be a little nore. For full instructions address Munn & 10. 361 Broadway, New York. Other foreign patents may also be obtained.

MRrunswick

The best Cigar for the money. Millions are sold each year. A luxurious smoke at a consistent price with good quality.

A fact proved by their enormous sales. JACOB STAHL, JR. & CO., Makers, 168th St. and 3rd Ave., N. Y. City.

Look for Arrow Head on Every Cigar.



IF YOU SHOOT A RIFLE Pistol or Shotmen, you'll make a Bull's Fistol or Shetgun, you'll make a Bull's
Eye by sending three 2c. stamps for
the Ideal Hand-book 'A." 126 pages
FREE. The latest Encyclopedia of
Arms, Powders, Shot and Bullets. Mention SCIENTIFIC A MERICAN, Address
IDEAL MFG. CO., NEW HAVEN, CONN., U. S. A.



Anyone sending a sketch and description may quickly ascertain our opinion free whether an invention is probably patentable. Communications strictly confidential. Handbook on Patents sent free. Oldest agency for securing patents. Patents taken through Munn & Co. receive special notice, without charge, in the Scientific American.

A handsomely illustrated weekly. Largest circulation of any scientific journal. Terms, \$3 a year; four months. \$1. Sold by all newsdealers.

MUNN & Co. 361 Broadway, New York

Che Cypewriter Exchange



FACTORY FOR SALE

On account of removal to larger premises the KIDDER PRESS CO. offer for sale their factory at 26-34 Norfolk Av., Boston, Roxbury District, comprising about 22,000 feet of land, 3-story brick building, 7,000 square feet each floor, brick boiler bouse, 3-story frame factory building, boiler, engine, main line shafting on each floor, exhaust heating plant, also storage yard of abbout 9,200 square feet with storehouse on same; a hargain for a manufacturer whose business is adapted to the size of the plant, Inquire on the premises.

SAVE ONE-HALF YOUR FUEL Rochester Radiator Co. 26 Furnace St. Rochester, N.Y.

A NY interested in Art, Artistic Shading or Coloring will do well to write The Air Brush Mfg. Co. 80 Nassau Street, Rockford, Ill., U.S. A.



ELECTRICAL BARGAIN MACHINERY BARGAIN ARC LAMPS. ALL KINDS AND SIZ OF DYNAMOS ENGINES MOTORS CORRESPOND WITH US TO BUY OR S THOMPSON SON & C.P. 105 LIBERTY ST. N.

SIMPLEST IN CONSTRUCTION. LESS IN PRICE. ECONOMICAL. GREAT-EST EFFICIENCY. NO REPAIRS. CAN ATTACH TO ANY STEAM ENGINE.

SEDGWICK-FISHER CO. 53-55 S. CLINTON ST. - CHICAGO

Mention Scientific American.

N. Y. CAMERA EXCHANGE.



50% Saved on all makes of Cameras Headquarters for Buying, Selling and Exchanging Cameras or Lenses. Large assortment aiways on band. Developing, Printing, etc.

N. Y. CAMERA EXCHANGE, 114 Fulton St., NEW YORK RUBBER STAMP MAKING. - THIS

article describes a simple method of making rubber stamps with inexpensive apparatus. A thoroughly practical article written by an arrateur who has had experience in rubber stamp making. One illustration. Contained in SUPPLEMENT 1 1 1 0. Price 10 cents. For sale by Munn & Co. and all news@calers.

PEWHEELS MODELS & EXPERIMENTAL WORK, SMALLMCHIRER VIELLES & EXPERIMENTAL WORK, SMALLMCHIRER VIELLES & ETC. HEW TORK STREET WORKS TOO NASSAUST N.Y.

MODELS & EXPERIMENTAL WORK.
Inventions developed. Special Machinery.
E. V. BAILLARD, Fox Bldg.. Franklin Square, New York.

D'AMOUR & LITTLEDALE MACHINE CO. 130 WORTH ST. NEW YORK. Make Models of Any Dirichine to Order.

TURBINES JAS. LEFFEL & So. A.

WANTED—to buy, a small second-hand Ice PlantMa-chine, in 200d working order. Plate system preferred, Capacity, 10 to 30 tons a day. State lowest cash price, Address W. J. SIMMONS & CO., NORFOLK, VA.

GAS ENGINE CASTINGS.

Materials and Blue Prints. Write for Catalog, PARSELL & WEED, 129-131 West 31st St., New York

AUTOMATIC MACHINERY BUILT to order. Our facilities and experience in this line are exceptionally advantageous. We invite correspondence from inventors of mechanical devices.

OPT. MERGENTHALER COMPANY,
Incorporated, Baltimore, Md.

Magneto for Gas or Gasoline Engine Igniters
No batteries used. Self-lubricating bearings. Dust
and moisture proof. Brushes self-adjusting. Material and workmanship the BEST. GGARANTEED
FOR ONE YEAR. Send for circular and price list.

GIDDINGS & STEVENS, Rockford, Ill. BALLS In Ivory up to 4 inch. In Composition, in Lignaum Vite, Mahogany, Hard Ma ple. Birch, Soft wond of B. A. STEVENS, Toledo, Ohio.

Send us your address and we will show you to make \$3 a day absolutely sure; wo the locality where you live. Send us your address and we will explain the business fully, remember we guarantee a clear profit of \$3 for every day's work, absolutely sure. Write at once, ROYAL MANUFACTURING CO.. BOX 354, Detroit, Mich.

FOR SALE-Best possible Republican Badge (patent applied), for cash, royalty or otherwise. R. E. A., Box 773, New York.



NOW READY.

AN AMERICAN BOOK ON

Horseless Vehicles,

Automobiles and

Motor Cycles.

OPERATED BY

Steam, Hygro-Carbon, Electric and Pneumatic Motors.

By GARDNER D. HISCOX. M. E.

Author of "Gas. Gasolene and Oil Vapor Engines." and "Mechanical Movements, Devices and Appliances."

PRICE \$3.00 POSTPAID.

This work is written on a broad basis, and comprises in its scope a full illustrated description with details of the progress and manufacturing advance of one of the most important innovations of the times, contributing to the pleasure and business convenience of mankind. The make-up and management of Automobile Vehicles of all kinds is liberally treated, and in a way that will be Photo supplies of every description at lowest prices.

Send 2e. stamp for largain list. Address

The book is up to date and very fully illustrated with

various types of Horseless Carriages, Automobiles and Motor Cycles, with details of the same.

Large Svo. About 400 pages. Very Fully Illustrated.

Send for circular of contents

MUNN & CO. 361 Broadway, New York

A Handy Book for Handicrafts-Wen



There is a "pocket preceptor" about Tools-an encyclopedia of information concerning every tool used in every trade, with an illustration of it. It contains tool knowledge in a nutshell and is called

MONTGOMERY & CO.'S TOOL CATALOGUE.

The latest edition is printed from new type and contains lots of new matter and hundreds of new pictures. Copious index. Pocket size. Free by mail, 25 cents.

MONTGOMERY & CO., 105 FULTON STREET, NEW YORK CITY.